EVS

BOOK 1

KM-106

THE WEB OF LIFE

At the time of our independence and in the fifties, we all looked forward to a brave and bright new world. We had unbounded faith in science and the miracles it would work to eradicate the ills of society. Now we see the ancient wisdom that what really counts is the human spirit, the human approach in science as in everything else. Let us not blame science which has unveiled for us some of the mysteries of our own minds and bodies no less than the miracles of outer space. Let us blame ourselves as Governments and citizens for seizing these wondrous opportunities not to help our fellow Man but destroy or maim him, not to make up whatever deficiency there might be in our earth but to deplete its treasures. For what? For every temporary gain, or physical comfort, or goods of which we soon tire, as does a child who has a surfeit of toys.

— *Indira Gandhi*
in *Indira Gandhi on Environment,*
(Department of Environment, Govt. of India)

SIKSHA MITRA
(Learning Centre)
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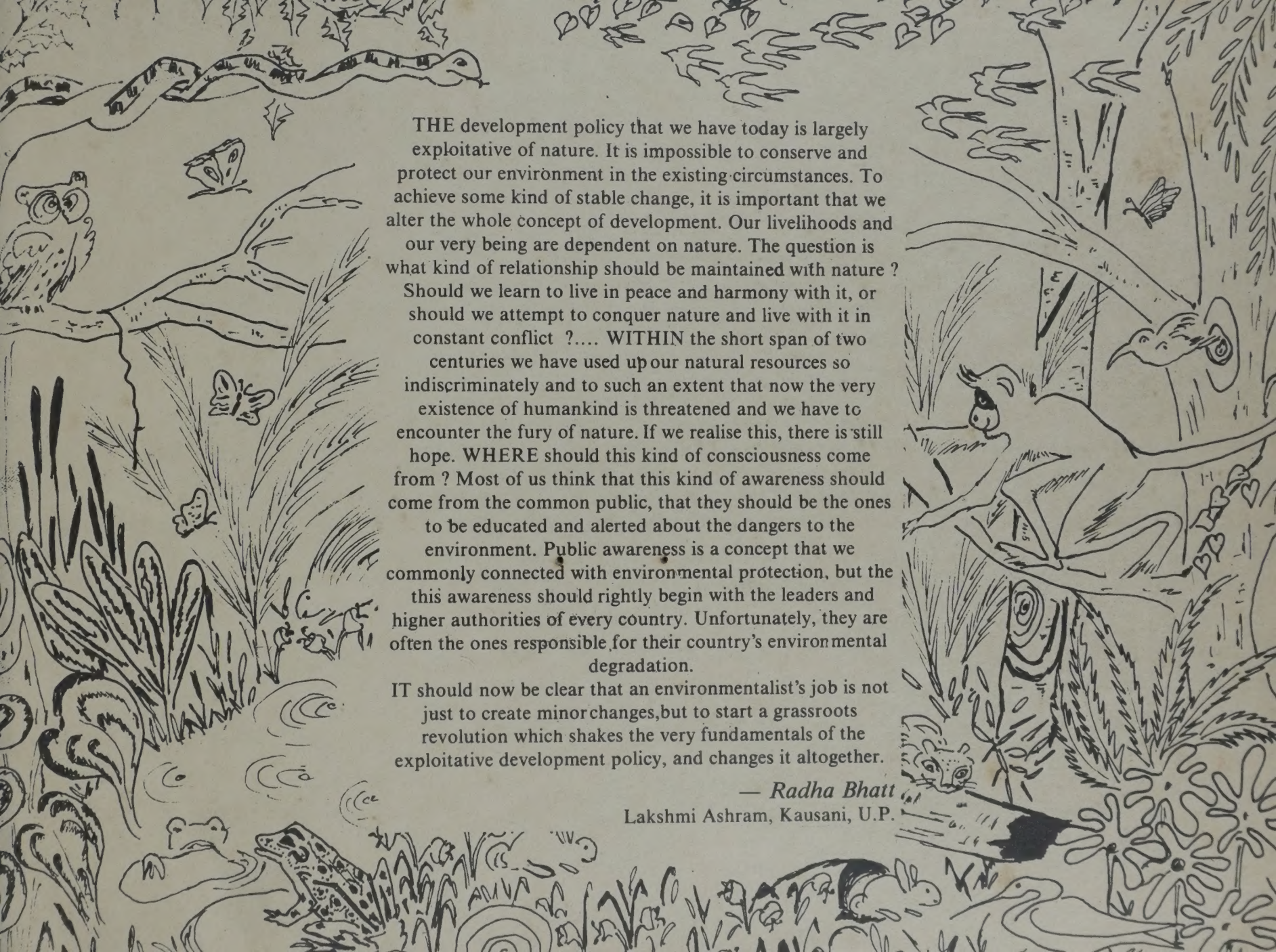

THE development policy that we have today is largely exploitative of nature. It is impossible to conserve and protect our environment in the existing circumstances. To achieve some kind of stable change, it is important that we alter the whole concept of development. Our livelihoods and our very being are dependent on nature. The question is what kind of relationship should be maintained with nature ? Should we learn to live in peace and harmony with it, or should we attempt to conquer nature and live with it in constant conflict ?.... WITHIN the short span of two centuries we have used up our natural resources so indiscriminately and to such an extent that now the very existence of humankind is threatened and we have to encounter the fury of nature. If we realise this, there is still hope. WHERE should this kind of consciousness come from ? Most of us think that this kind of awareness should come from the common public, that they should be the ones to be educated and alerted about the dangers to the environment. Public awareness is a concept that we commonly connected with environmental protection, but the this awareness should rightly begin with the leaders and higher authorities of every country. Unfortunately, they are often the ones responsible for their country's environmental degradation.

IT should now be clear that an environmentalist's job is not just to create minor changes, but to start a grassroots revolution which shakes the very fundamentals of the exploitative development policy, and changes it altogether.

— *Radha Bhatt*
Lakshmi Ashram, Kausani, U.P.

THE WEB OF LIFE

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How this Pack came to be Written

The Web of Life has been many months in the making. The process of its evolution is a story of many hands, heads and hearts.

It began with the coming together, in New Delhi, of a group of teachers, students and others concerned about environmental activities in schools at a workshop organised at St. Columbas School in 1984, by Kalpavriksh. By 1986, this group had evolved into the informal Schools Environment Network with Keerti Jayaram of the Teachers' Centre, Ramjas School, R.K. Puram, as the coordinator. We have also enjoyed the unstinting support of her Principal, Meera Balachandran, and of several young members of Kalpavriksh, the environmental action group.

At one of the early meetings, Usha Mani, formerly of the Convent of Jesus and Mary, said teachers needed support materials and suggested that we should try to fill this need. In November 1986 with seed money from the Environmental Services Group, New Delhi, a three-day introductory workshop for teachers was organised, and an environmental resources pack was hastily put together, primarily for the workshop, by Keerti, Usha, Ashish Kothari (Kalpavriksh), Jayashree Oza (then at Bharatiya Vidya Bhawan), Suniti Chapekhar (Air Force Central School), Saroja Srinivasan (Ramjas School, R.K. Puram), Elizabeth Achar (National Museum of Natural History) and myself, Sumi Krishna.

We soon ran out of our cyclostyled resource materials. Encouraged by this response, we planned to revise and expand the material for publication and wider use. In early 1988, we got a small grant from the Ministry of Environment and Forests, channeled through the Bharatiya Vidya Bhawan by the kind courtesy of former Principal M.P. Chhaya, and his successor, Venkatachalam, to all of whom we are most grateful.

Stretching our shoe-string budget to its limit, we organised a Principals' workshop followed by several teachers' workshops and inter-schools activities for students. The group, always an informal one, also changed over the months. Some schools and individuals lost interest. Others joined, such as Jean Menezes, imbuing the Network with freshness and renewed enthusiasm.

The Schools Environment Network has had the invaluable support of many experienced persons. Jayashree Oza (now at Apeejay School, Noida) and Ashish Kothari (Kalpavriksh) spent much time and effort, and their commitment and input, in the crucial early stages, helped to give impetus and direction to the Network. But even as it took shape, the introductory notes and activities were tested by teachers both within and outside classroom situations. This feedback led to some sections, or activities, being modified, or dropped altogether.

We were also encouraged by the support of many Principals, teachers and environmental educationists, notably Jose Paul (Teachers Centre, St. Xaviers School), Saroja Sundarajan (then at Teachers Centre, Springdales School), Vibha Parthasarathy (Principal, Sardar Patel Vidyalaya) Joy Michael (Former Principal, St. Thomas School), S.D. Purohit (Principal, Happy Jain School), Gabriel Gonsalves (former Principal, Sahoday School) the Principal and teachers of Blue Bells School and of Mirambika School, and the Director, of the National Natural History Museum).

Many other resource persons, college students and environmental activists, contributed to our workshops; to them we owe many thanks : Anupam Misra (Environment Cell, Gandhi Peace Foundation), Saroja Srinivasan (Ramjas School, R.K. Puram), Ajay Mahajan, Gazala Shabuddin, Pia Sethi, Ashok Bhatnagar, and Shekhar Singh. Thanks are also due to Claire Noronha and Amit Jayaram, and to K.P.S. Chauhan (Ministry of Environment and Forests), whose ideas and suggestions have been invaluable through all the stages of this project.

The responsibility for production fell mainly on Jean. We are also indebted to Michael Menezes and Pinaki Dasgupta (Maadhyam) for their generous help and support in the designing and production process, and to our printer, M.L. Jain.

The extracts in the pack have been drawn from many sources, with due acknowledgement. The illustrations are by several hands including Sui Ming, Suniti Salaam, Suchitra Srinivasan, Latika Nath, Anubha Banerji, Pia Sethi, Suparna and the children of Mirambika School, the children of Ramjas School, R.K. Puram, Tarun Jayaram of Mother's International School, Sandeep Krishna of Springdales School, Dhaula Kaun, Jean, Keerti and myself. Some illustrations were redrawn from various publications including those of the Centre for Science and Environment, New Delhi; Earthscan, London; Panos, London.

The creation of ***The Web of Life*** has been a learning and doing process, which is partly why it has taken so long. I am sure there are still many ways in which it could be improved, and it is presented only as an example of what can be accomplished with little money, but with the committment and cooperation of many volunteers, who contributed time and effort for little or no payment.

New Delhi, 1993 Sumi Krishna

It is not half so important to know as to feel.

— Rachel Carson

A Note to the Teacher

The importance of stimulating environmental awareness among children and youth is now well-recognised. Since the 1970s, new curricula and teaching methods have evolved in response to this vital need. At the two ends of the educational spectrum — primary school and university — environmental studies have also acquired a distinct identity as a separate discipline.

The objective

The Web of Life, a resource pack consisting of 10 booklets, is an attempt to provide teachers and students with the kind of materials that they can use themselves over a period of one school year, or more. The broad objective is to :

* arouse children's interest in the environment through a sense of wonder and fun.
* enable children to acquire information and skills, and to develop their own knowledge and attitudes to the environment, without indoctrination.
* encourage children to care for the environment, and to express this in practical ways.

The approach

Environmental education helps to bridge school learning and the world outside. In India, considerable experience has developed at the primary level in using the environment as a resource in the learning process. Studies conducted by universities and research institutions have increased our knowledge about the environment. Voluntary organisations, the media and concerned individuals, who have championed environmental causes, have helped to spread a sense of responsibility for the environment. This resource pack draws upon all these positive factors.

Our approach is to further the understanding of environmental concepts, and to facilitate a process of learning so that students can make their own judgements. Although we may often have a definite stand on a particular issue, we believe that it is important to give students the "space" to grow and develop their own positions on environmental issues. There is no sharp dividing line between environmental education and environmental activism. Teachers and students have to decide this for themselves.

What is required of teachers ?

Environmental issues do not come labeled to fit easily into subject slots : science, social studies, humanities. Because the environment is so complex — an ever-changing "web of life" —environmental problems are extremely multifarious. Environmental education teachers may, therefore, have to deal with topics which lie beyond their traditional subject areas. But most environmental concepts are not difficult to understand, and this resource pack does not need any special knowledge of science or any particular subject. Language, civics and geography teachers, for instance, have been especially successful in using the environmental approach.

Teachers who deal with environmental activities do need special qualities, but these are human and educational qualities, not subject skills or knowledge. An environmental activities teacher (or group leader) has to :

a. Arouse interest, raise problems, select issues to work upon.
b. Help students identify information sources, handle reference materials and work together in groups.
c. Arrange for wider interaction of students, through guest lectures, excursions etc.
d. Enable students to see the relevance of their activity to that of the group and society.
e. Initiate and develop discussions, draw various aspects together, balancing the pros and the cons of an issue.
f. Encourage students to express their concerns and create opportunities for displaying and sharing their work with a larger community.

How to use the pack

This pack is mainly geared to middle and senior school level students, but also includes some activities suitable for younger children. It can be used both within and outside the school system, by individuals or groups, by teachers and students, by parents and children, or by voluntary organisations. It includes a variety of real life (rather than text book) material drawn from newspapers, magazines and other popular reports on the environment. At the same time, it also includes information from the frontiers of environmental thinking and research.

The Web of Life begins with a brief overview of India's environmental crisis (in this booklet). Next is ONE EARTH, mainly a fun booklet, with activities and some examples of the response of young children to environmental issues. Each of the next seven booklets (3-9) covers one major environmental topic. Every one of these booklets has an introductory note and a set of activities. The last booklet (10) deals more specifically with people's action and selected issues.

Each booklet is organised into manageable units, with activities and projects of varying difficulty and suitable for different age groups. You can go through the booklets in order, doing one book each month, over the school year (or over two schools years). Or you could select one or more booklets, or a set of activities, which may be of special interest to a group of students. You could also choose activities in a particular subject area from a number of booklets. (The grid on the following pages provides a key for this) Some teachers found that Booklet 3 (ECOLOGY) or 6 (LIVING RESOURCES) was a good base to start from.

The Web of Life is not just a title; it is the theme that runs through the booklets. Everything is inter-linked. So, there are often activities in one booklet which have a bearing on the topic of another. These have been cross-referenced where possible. Some of the activities are specifically related to Delhi (this was in response to the feedback we got from local schools), but these can be easily adapted to other regions, and there are plenty of other activities as well. Actually, more than 100 in all !

SUBJECT WISE KEY TO ACTIVITIES

ACTIVITY NUMBERS

S.NO.	BOOK	LANGUAGE	ART & CRAFT	SCIENCE	HISTORY	CIVICS	GEO-GRAPHY	MATHS	GAMES & QUIZ	SPECIAL PROJECTS
1.	ONE EARTH	1,4,6,7, 9,10,11	2,9,12	5,7,8,10			1,3,4,5		8	10
2.	ECOLOGY	1,4,6,7 10,11,12	1,9,10 12	1,2,3,4, 5,6,7,8, 9,10,11			12	9	3,5,8,9	12
3.	LAND & WATER	1,3,7,11 12	1,7a	3,4,5,6, 7,7a	5	3	2,4,5,6 8,9,10,11		2,10	12
4.	TREES & FORESTS	1,12	2,3,10	3,4,5,8 10	4,12	6,7,9,10	6,7	5	11	
5.	LIVING RESOUR-CES	1,6,7,8, 9,11,12	1,3,4, 10,11	2,3,5,7 9,10,12		11			5	12
6.	HOUSES & CITIES	1,2,4,9 10,12	2,5,10	6,7,2	1,4,9,10	3,5,8 10,11,12	1,9	3,8	12	11
8.	ENERGY	1,2,3,11	1,8,9	3,4,5,6 10,11		2		4	4	11,12
9.	POLLUTION	1,2,3,5 6,8,10,11	2,5,7	5,6,8,9 10,11,12		3,5,6	4	9	8,12	

INDIA'S ENVIRONMENT – A BRIEF OVERVIEW

India, today, faces a severe environmental crisis. This is well known. But what consititutes this crisis ?

India's natural environment is rich and abundantly diverse. It has a great variety of climates, altitudinal and ecological conditions, plant and animal life. This natural wealth has immense potentialities to fulfil the needs of all our people both in the present and in the future.

However, this depends on whether we are able to manage our environment in such a way that its productivity is sustained, and on whether we can ensure that the benefits of development reach all sections of our people equally.

After Independence, we have made rapid progress in some fields. Unlike many other countries in the world, we manufacture most of the things we need, and we produce enough food for our people. But the advances of modern industry, agriculture, science and technology have been achieved at a tremendous cost to the environment, and the benefits have gone mainly to the more priveleged 30 per cent of society.

The Crisis

The direction of our development in the last 200 years, and especially in the recent past, has put us in a perilous trap. The consequences of inequitable and environmentally unsound development are devastating. These include :

* *Destruction of land, water and vegetation* — Roughly 50 percent of our land is eroded, degraded and depleted of its fertile potential; Till recently, over a million hectares of valuable forests were being lost each year. In the 1980s, more than half of all our districts suffered from floods or droughts.

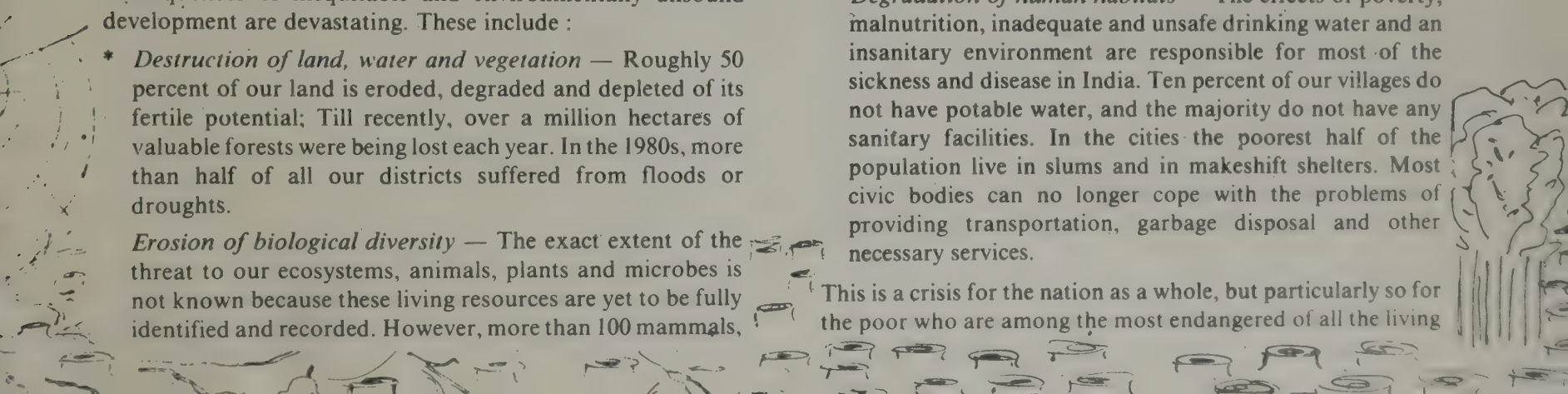
  Erosion of biological diversity — The exact extent of the threat to our ecosystems, animals, plants and microbes is not known because these living resources are yet to be fully identified and recorded. However, more than 100 mammals, birds, reptiles and amphibians have been declared rare or endangered and more than 2,000 flowering plants are known to be threatened. The position of fish, invertebrates, non-flowering plants and microbes may well be worse. Variability within species (such as the wild varieties of rice, other cereals, pulses and vegetables) has been severely depleted during the last few decades. Our marine resources are being exploited indiscriminately.

* *Depletion of renewable and non-renewable resources*— In the year 2001 the demand for fuelwood will reach 382 million tonnes (120 m. tons more than in 1981); the fodder shortage is even more acute. Our known reserves of fossil fuels and mineral resources are being rapidly depleted even at present rates of consumption.

* *Pollution of atmosphere, water, land and food* —Indian women who cook on woodfires inhale 40 times the level of suspended particles considered safe. Labourers who spray chemical pesticides on crops, and workers in many hazardous industries suffer from debilitating pollution diseases. Most of our surface water sources are unsafe to drink. Emissions from industries, power plants and motor vehicles exceed the safety level in many cities.

* *Degradation of human habitats* — The effects of poverty, malnutrition, inadequate and unsafe drinking water and an insanitary environment are responsible for most of the sickness and disease in India. Ten percent of our villages do not have potable water, and the majority do not have any sanitary facilities. In the cities the poorest half of the population live in slums and in makeshift shelters. Most civic bodies can no longer cope with the problems of providing transportation, garbage disposal and other necessary services.

This is a crisis for the nation as a whole, but particularly so for the poor who are among the most endangered of all the living



beings in our country. This is because the vast majority of our poor people subsist on the bioresources (biological resources) of the earth. Their local environment provides them with food, fodder, fuel, building materials and medicines without which they could not survive.

The Solution

Clearly, it is now time for us to think about the direction in which we are going. We need to question the thrust of our development, and to give it a new impetus towards sustainability and equity.

So where do we go from here ? What do we do ?

First, we must *conserve our resources.* The resources of the Earth are finite, and they are all that we have. Between the 18th and the early 20th centuries, Europe and the United States were able to use the resources of their colonies to build affluent modern nations. Today, no one has that kind of option any more.

Although untapped reserves of minerals and energy sources exist, the minimum cost of even the cheapest fossil fuels and solar energy collectors will continue to be far beyond what the majority of people can afford. Technological innovations have helped to increase the resource base in the past, but new technology takes time to develop and implement, and many new innovations have had damaging side effects, which often were not anticipated.

We, in India, have no alternative but to depend on our own resources, to make better use of existing resources through conservation and reuse, and to ensure that everyone benefits equally from these resources.

Secondly we must *calculate what economic growth really costs.* We cannot ignore the hidden costs which are passed on to the natural system or to the most vulnerable sections of society. For instance, in the building of a big river valley project, we must weigh the benefits of more electricity and irrigation, against the cost of, submerging a forest and displacing thousands of people. We need to ask who pays the ecological, social and human costs? Who reaps the economic benefits?

Thirdly, we need to *develop appropriate technologies* to restore, maintain and utilise the resources of our environment sustainably. Whether it is a computer or a cloth rag to filter water, technology is simply the right device to do something better. It extends our capabilities and our vision of the world. The direction in which a society develops depends largely on the kind of technology it uses. Technology is appropriate when it is geared to the needs of the majority, and can be controlled and operated by people, rather than by experts alone.

Fourthly, we must *restrict unsustainable consumption.* The benefits of high technology have been enjoyed by a small minority who consume the major part of many resources, such as timber, fossil fuels and minerals. One rich person has a much greater impact on the environment than one poor person. We need to adopt non-polluting, non-wasteful lifestyles in keeping with our social and cultural traditions. We need to develop the inner strength to make the right choices. Individual attempts to conserve resources may seem inconsequential, but in the long run everyone will have to behave as a conservationist, in each one's own life.

Fifthly, the *people's right to information must be recognised.* People need to know how decisions are being taken, especially when these decisions affect their immediate environment and their future. We also need to know how specific changes affect the larger ecological systems. We need to de-mystify technical information. It is only then that an atmosphere of accountability and responsibility towards the environment can be built up and maintained.

SUMMIT TO SAVE THE EARTH — RIO 1992:

In June 1972 the first earth summit was held in Stockholm, Sweden. Exactly 20 years later the second Earth Summit was held in Rio de Janeiro, Brazil. The outcomes from Brazil: a declaration of principles and an action plan. In particular two international treaties were signed. One deals with man made global warming that is likely to change the world's climate in the next century. The other is concerned with protecting bio-diversity i.e. the richness of the earth's plant and animal species.

More than a 100 world leaders and 30,000 participants from a 150 nations assembled in Rio de Janeiro (Brazil) in June '92 at the biggest ever Summit on the Environment. They brought with them the recognition of the fact that the future of our planet was under grave threat. A clear signal that went out at the United. Nations Conference on Environment and Development (The official name of this meeting) was that environment issues cannot be de-linked from development issues.

* The developed countries of the North have grown accustomed to life-styles that are consuming a disproportionate share of natural resources & generating the bulk of pollution.

*The developing nations are consuming irreplacable global resources — eating the worlds seed corn, as it were — to provide for their exploding populaton.

The Summit through its various conventions called for the nations of the world to abandon those practices that are self-destructive, in favour of what environmentalists call "sustainable development" i.e., a society which manages its economic growth in such a way as to do no irreparable damage to the environment.

Funding was a major problem. The North has it. The South needs it. The changes that must be made to attain "sustainable development" will not occure unless some of the wealth finds it's way from the North to the South. The two primary Earth Summit texts: a five page "declaration" and a 600-plus-page "blueprint for action called Agenda 21" which came as an outcome suggests some means through which the Nations of the world should enter into a constructive partnership in which technology and finances are used for the preservation of the earths' resources & the mutual benefit of all.

What they agreed to:

*AGREED in principle, that, polluters ought to bear the cost of their pollution, that poverty ought to be eradicated and that "appropriate demographic policies" (i.e., family planning) ought to be promoted.

*ACKNOWLEDGED that developed countries, having put more pressure on the world environment, bear some responsibility for putting it right.

*AGREED to give "special priority" to the need of the developing countries-without specifying what those priorities might be.

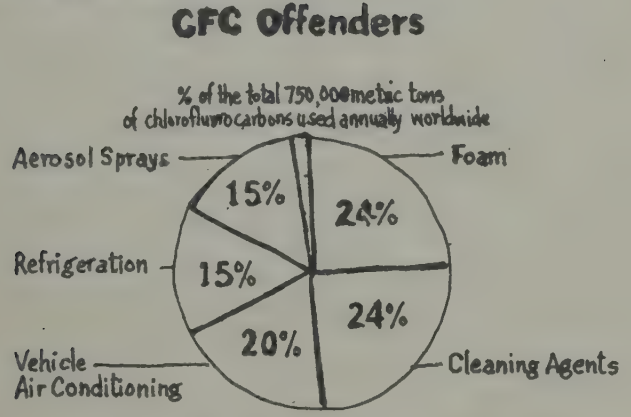
*CAME UP with a 600-plus-page "agenda" to save the planet, with a price tag of more than 600 billion dollars a year but not yet agreed on plans for raising the bulk of the money.

*AGREED to try to roll back emissions of carbon dioxide and other greenhouse gases by the end of the decade, with the understanding that 1990 levels would be a desirable-but not mandatory-target.

* EXTRACTED a 75 million dollars commitment from the U.S. to help developing countries with the effort to combat global warming.

Some Questions

Who is turning the heat on?



Gases from discarded refrigerators are the main cause for the depletion of the protective Ozone layer. After chloroflourocarbons (CFC's) became the prime suspect for causing ozone depletion, research found that each molecule of a CFC was capable of destroying one lakh ozone molecules. The overall depletion in the ozone layer is now estimated to be approximately 8 percent. India's ranking as an emitter of greenhouse gases is controversial. It varies from the fifth larger emitter (WRI, 1991) to the sixteenth largest emitter (CSE India 1991).

The 80's saw six of seven hottest summers in 150 years. The apparent culprit: a 26% rise of carbon dioxide in the atmosphere since the pre-industrial revolution level. The source was the 1.8 billion tonnes of CO_2 we send into the air by burning coal and driving cars.

In the year 1800 there were 280 parts per million of CO_2 in the atmosphere. Now there are 350 ppm and this is expected to rise to 560 ppm by 2030 A.D. CO_2 is to blame for 56 percent of the greenhouse effect; CFC's (Which also damage the ozone layer) 23 percent; methane 14 percent and nitrous oxide 7 percent.

Who consumes the earth's resources?

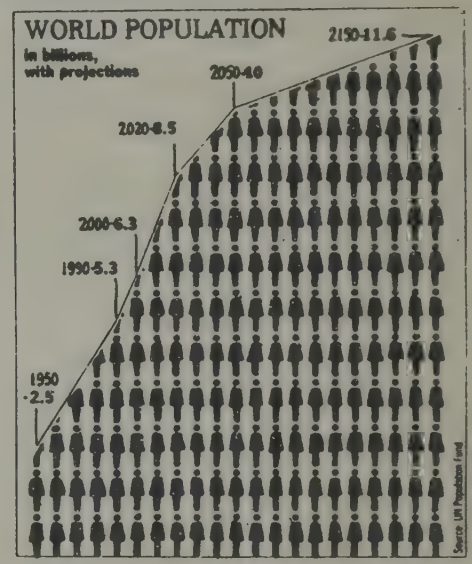
Although industrialised countries have virtually stable populations (their average annual growth rate is only 0.4 percent a year) they are putting a disproportionate strain on the natural world. The rich North consumes 80% of the worlds global resources. In one year an average person in the West is likely to;

— consume more than 264 lbs of paper compared to 17.6 lbs in the third world.

— 990 lbs of steel, compared to 4.4 lbs in the third world.

— purchase energy equivalent to almost 6 tons of coal compared with 0.5 tons in the Third World.

What triggered the population explosion?



There are now more than five billion people in the world — and the figure could double by the middle of the next century. 90% of this growth over the next 50 years is expected to be in developing countries which are already striken by poverty & food shortage. Cities are swelling to unmanageable proportions. In 1950 only 17 per cent of the people lived in cities, by 2020 the figure is expected to rise to 50 percent.

The water problem?

60 percent of the population in poor nations do not have access to safe drinking water. Unfortunately for them with issues like global warming and loss of biodiversity dominating the Rio Conference, the money for their "mundane" problems seems to be hard to come by.

The world's water meanwhile continues to be unevenly distributed.

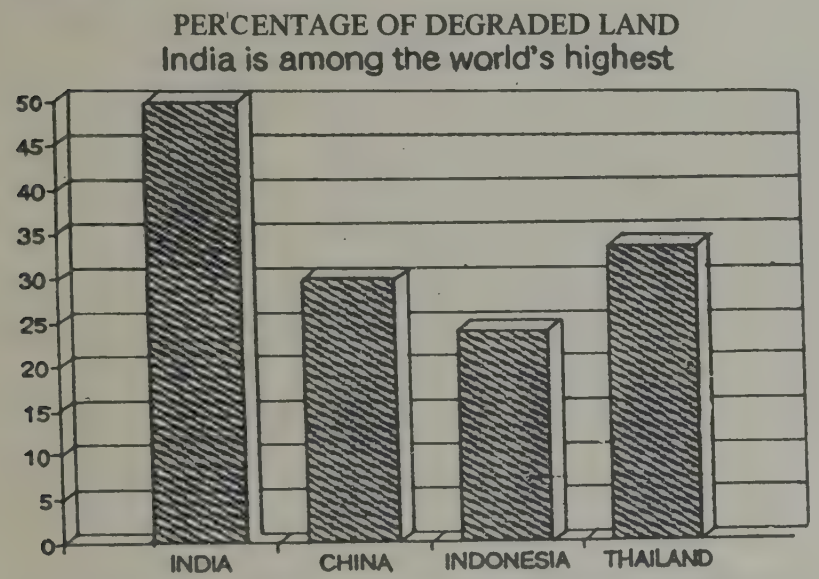
— Households with dishwashers, washing machines & sprinklers consume 1000 litres per head per day.

— Household with piped supply & taps consume 100-350 litres per head per day.

— Households using a public hydrant in the street 20-70 litres per head per day.

— Households depending on a stream or handpump: 2-5 litres per head per day.

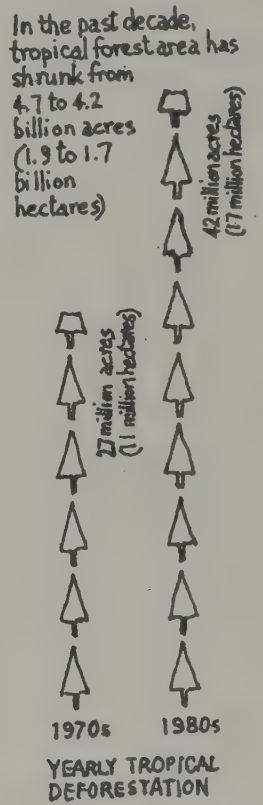
Where have the green areas gone?

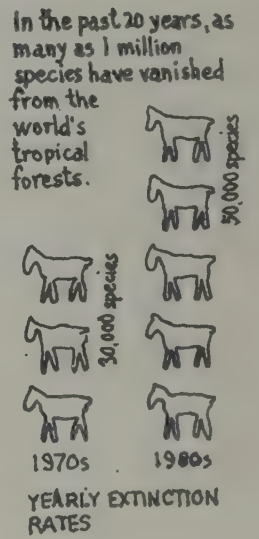


Each year about 11 million hectares of arable lands are lost through erosion, desertification, toxification and cropland conversion to agricultural uses. If this trend continues unchecked, we shall lose 18% of our arable lands by the year 2000. Every decade, 7% of the worlds' soil is lost through large scale farming techniques. In the US farmers work the soil so hard that an area twice the size of California has been rendered unproductive. Formation of 2.5cm of topsoil can take anything from 1000 to 2,500 years depending on the soil type. Unfortunately reversing this process is all too quick — we can destory 2.5cm of top soil in as little as 10 years.

If India has amongst the highest percentage of degraded land in the world, a major reason is that it is losing forest at the rate of 2.8% annually. Much of its pastures are also overgrazed — the result being very little vegetation to hold the soil in place.

What is making the forests disappear?


In the past decade, tropical forest area has shrunk from 4.7 to 4.2 billion acres (1.9 to 1.7 billion hectares)
42 million acres (17 million hectares)
27 million acres (11 million hectares)
1970s
1980s
YEARLY TROPICAL DEFORESTATION


In the past 20 years, as many as 1 million species have vanished from the world's tropical forests.
30,000 species
30,000 species
1970s
1980s
YEARLY EXTINCTION RATES

Tropical forests harbouring some of the richest bio-diversity are under severe pressure the world over. In 1980, FAO studies indicated that in Asia and the Pacific region alone 2 million hectares of forest were being lost annually. In 1990, statellite imagery indicated that the deforestation rate may have been as high as 5 million hectares per year in the last decade. Among the major causes in industrial demand, commercial logging, followed by shifting cultivation and lastly fuelwood consumption for domestic energy.

Nature is the soul of the world
Agony is its present swirl
Technology is its basic cause
Unveiling the truth reveals a silent pause
Raise your hands for Delhi's future
Even the best doctor cannot this wound suture.

My past is glorious, my present a misery. But this can't last. I remember the lights and the music - the splendour of my youth. Emperors have passed through, marvelling at my majesty. Warriors have fought and died to conquer me. Poets and philosophers have written epics in my honour. And as they came, so also they left. I have seen those arrogant conquerors razed to dust.

Delhi's changing environment,
Does not quite give me excitement,
Its growing population,
May make a villager give an exclamation,
If only it were clean and nice, everybody would be content.

Delhi's changing environment,
Is like disgrace to this continent,
There's so much pollution,
Its getting difficult for the population,
To not express their sentiments.

I am a city and I have several names like Delhi, Bombay, Calcutta, Sonipat, Madras, etc. Nowadays the population inside me is increasing day by day. There are many industries set up in me so many people are coming here to get jobs in the industries and companies. When people come here they need shelter and they start living in unhygienic conditions. From there starts pollution.

- Today I am overburdened with this problem of pollution. Pollution ! Pollution ! Pollution ! Pollution everywhere ! Sound pollution. The noise in my environment is increasing day by day. Noise of vehicles, radios, television, irrigation pumps, etc., disturb the silence of the environment. This sound also causes vibrations in my buildings and there is a danger of the buildings collapsing.

CHILDREN'S VIEWS

Ramjas School

Mothers International

Convent of Jesus and Mary

St. Francis De Sales School

The bare brown ground stares back at us,
The chirpy birds no longer fuss;
Everything's so barren and empty,
Everything but Nature's love is present in plenty.

SUSHA MITRA
(Learning Centre)
Supported by : Swanirbhar
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**I'm a man who has returned to Delhi,
It has changed as far as I could see.
Forests turned to smoke,
And vehicles ready to choke.
And not a sight of a speck of a tree.**

**The tree heard the woodcutter say,
I will cut this tree down today,
The tree prayed for his life
And said, not to pierce him with a knife.
But the result, on the ground he lay.**

**If I was a tree
I wish I wasn't cut down
And still bared the green crown
So that I could serve you eternally.**

*A modern day monster
Not flesh and blood
But a steel and concrete one,
Hissing smoke, vomiting sludge ....*

*A cold night
Sky inky black
Unmarred by stars
Threatening blanket looming over, as if to smother.*

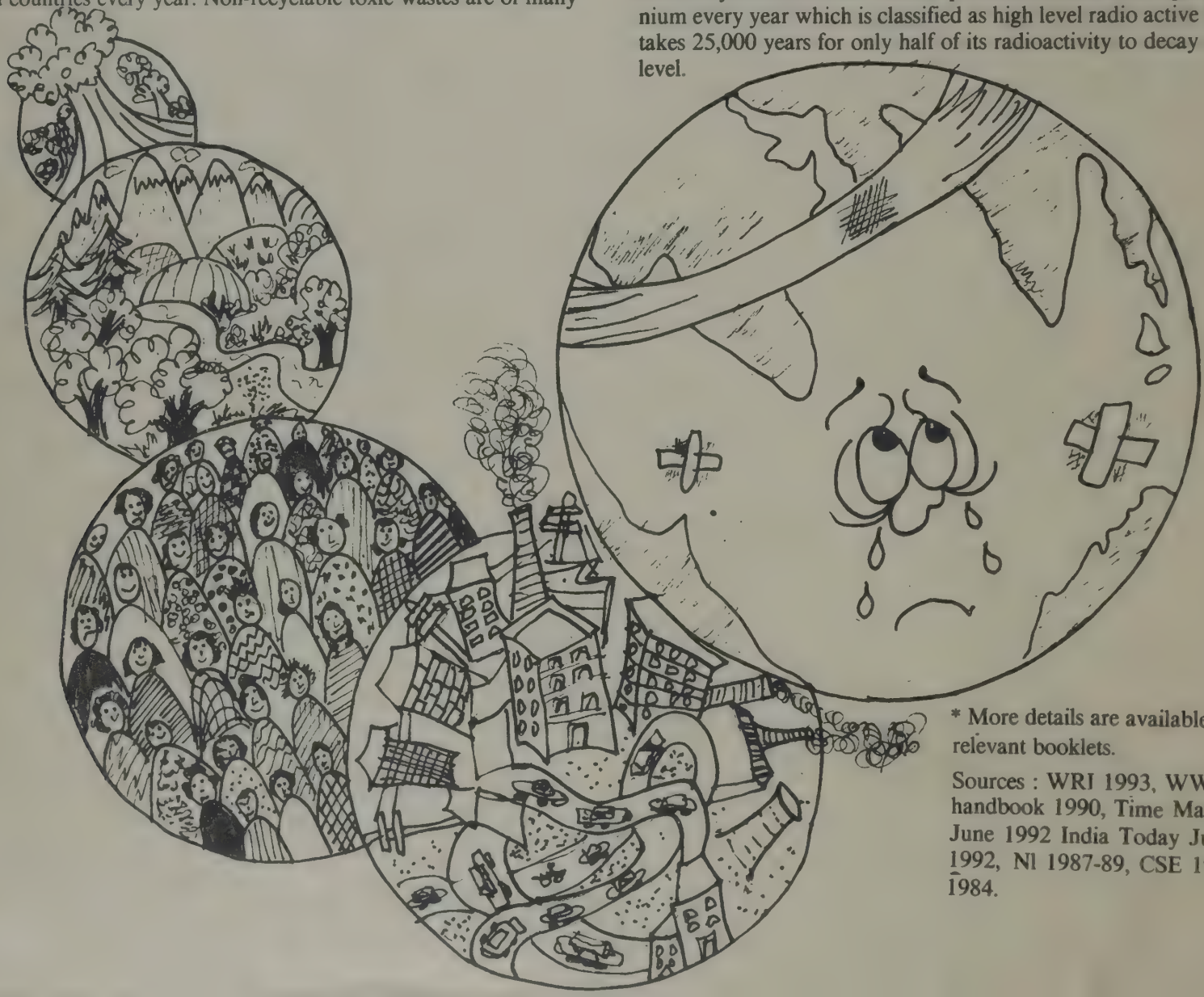
*The gentle twilight
Sweet, scented, balmy breeze
Nestling's call - contented sighs,
It's nature's pause.*

***Now a mere stump of a tree
A full-grown evergreen tree I need to be,
A villager burnt my branches,
Like wool cut off the sheep at the ranches,
My poor plight no one wants to see.***

***The tree heard the woodcutter say:
"I'll cut this tree today."
It trembled right down to the roots,
While the Woodcutter jumped in delight in his boots,
Soon the tree on the ground lay.***

Where are the garbage dumps?

The developed nations are producing more toxic waste than they can handle. Since 1986 over 3 million.tonnes of toxic wastes have been shipped from Western Europe & America to other countries. About 125000 tonnes of toxic wastes are sent to the third world from developed countries every year. Non-recyclable toxic wastes are of many kinds. For example — in the automobile industry — two pounds of hazardous waste are produced for each pound of plastic and 200 million pounds of plastics is used annually. Every year 100 million lead auto batteries are discarded releasing lead-laden acids. 400 nuclear power plants all over the world are producing 17% of the worlds electricity. Each nuclear reactor produces around 200 kgs. of plutonium every year which is classified as high level radio active waste. It takes 25,000 years for only half of its radioactivity to decay to a safe level.



* More details are available in the relevant booklets.

Sources : WRI 1993, WWF handbook 1990, Time Magazine June 1992 India Today June 1992, Nl 1987-89, CSE 1991, 1984.

Environment NGO s

ANDHRA PRADESH

Centre for Environment Concerns
Plot No 14,
Jyoti Co-operative Society,
Trinulghery Post,
Secunderabad 500 015
Contact Nisha Rao,
Activities for schools, teacher training, seminars & workshops.

Development Action for Rural Environment
1-1-770/5 Gandhinagar,
Hyderabad 500 380.
Contact K. Sridhar
work on rural and tribal areas

Bird watchers Society of A.P.
6-3-249/3, Road No 1,
Banjara Hills,
Hyderabad 500034.

Friends of the Trees
(Secunderabad Chapter)
263 Barein Patalam,
Secunderabad 500 003
Contact — Secretary

ASSAM

Assam Valley Wildlife Society
Pertabghur Tea Estate,
Post Sootea,
Sonitpur Distt 784, 175.
Contact UMPS Sidhu,
wildlife conservation in the North-East.

BIHAR

Rohini Science Club
Kokar,
Bank Colony,
Ranchi 834001
Contact GUS Sastry,
science & environmental eduation

Nature Conservation Society
P.G. Deptt of Zoology,
G.L.A. College,
Daltonganj 822 102
Contact D.S. Srivastava
environmental activities for rural schools.

Sulabh International
Gandhi Maidan,
Patna 800 001
Contact on Bindeshwar Pathak,
installation and low cost training for water-seal sanitary latrines.

Vikas Bharti
Bishnupur,
Gumla Distt 835 331.
Contact Ashok Kumar Bhagat
appropriate technology, research & conservation.

Xavier Institute of Social Service
Ranchi Jesiut Organisation,
Maresa House,
Post Box No 2,
Purulia Rd,
Ranchi 834 001
Contact Fr L. Francken,
Resource Centre for Development in Chhotanagpur region.

Institute of non-conventional Energy Sources, Bihar
Bari Road,
Patna 800 004,
Contact Secretary

CHANDIGARH

Environment Society of Chandigarh
Karuna Sadan,
Sector 11-B,
Chandigarh-160011.
Contact S.K. Sharma
educational and rural activities

DELHI

Centre for Science & Environment
F-6, Kailash Colony,
N. Delhi-110048
Contact Anil Aggarwal, research, documentation, seminars, workshops, reports on State of India's enviornment.

Conservation Society Delhi
N 7/C Saket,
New Delhi-110017
Contact Madhu Bajpai, audiovisual on historical monuments, conservation activities for students; resource centre.

Petroleum Conservation Research Association
709-711, Surya Kiran Building,
19, Kasturba Gandhi Marg,
New Delhi-110001.
Publications for Children.

Gandhi Peace Foundation—Environment Cell
221/223 Deen Dayal Upadhyay Marg,
New Delhi-110002
Contact Anupam Misra,
publication, research & promotion of environmental action.

Kalpavriksh—Environmental Action Group
I Court Road,
Delhi 110054
Contact Ashish Kothari,
work in schools, research and environmental action.

Society for Development Alternatives
B-32 Institutional Area,
New Mehrauli Road,
Haus Khas,
New Delhi-110016
Contact Ashok Khosla,
designing environmentally sound appropriate technologies for the mass market.

Indian National Trust for Art and Cultural Heritage
71, Lodi Estate, New Delhi 110003
Contact N.D. Jayal, environmental action and publications.

Tata Energy Research Institute
7 Jor Bagh,
New Delhi-110007
Contact Director,
promoting, renewable sources of energy.

Voluntary Health Association of India
40, Institutional Area,
New Mehrauli Rd,
New Delhi-110016
Contact — Director
Activities — Training and educational programmes and materials on integrated health care

Environmental Services Group
B-1, LSC, J, Block Market,
Sakat, New Delhi-110017.
Contact Thomas Mathew,
documentation and audio-visuals for schools.

GUJARAT

Ahmedabad Study Action Group
Dalal Building,
Behind Hotel Capri,
Relief Road,
Ahmedabad 380 001
Contact Rajesh Bhat,
education for slum children, low cost housing, alternative energies.

Centre for Environment Education
Nehru Foundation for Development,
Thaltej Tekra,
Ahmedabad 380 054
Contact Director,
educational materials, work with schools.

Hindolgarh Nature Conservation Education Programme
646 Vastunirman Society,
Sector XXII, Gandhinagar 382022
Contact Director
to organise annual camps for children.

Gujarat Energy Development Agency
Documentation Centre,
3rd Floor, B N Chamber
R.C. Dutt Road,
Vadodara 390005
Activities and publications for schools.

Sarvodaya Pariwar Trust
Pendival
Tehsil Dharampur,

Valsad Distt 396 050.
Contact Kanti Shah,
activities with tribals.

Sundarvan
Next to ISRO,
Jodhpur Tekra,
Ahmedabad 380 015.
Contact Lavkumar Kacher,
Filmshouse, camps, non-formal education.

The Goa Foundation
Above Mapusa Clinic,
Mapusa 403 507.
Contact Claude Alvares.
preparation of Goa Environment Report, action, education & training

HARYANA

Haryana Social Work & Research Centre
Khori,
Mohindergarh Distt 123 101.
Contact Director, activities relataed to rural development

HIMACHAL PRADESH

Himalayan Nature & Environment Preservation Society
Atma Cottage,
Upper Kaithu, Shimla 171 002.
Contact Tejasvi Duggal,
organising camps & lectures for youth.

JAMMU & KASHMIR

Indian Society for Himalayan Studies
Rengco Campus,
Hazratpal,
Srinagar 190 006.

Ladakh Ecological Development Group
Karzoo,
Hel, Ladhak 194101
Contact Thukstan Chheewana

KARNATAKA

Birdwatcheres Field Club of India
Dodda—Gubbi Past,
Karnataka 562 134
Contact Zafar Futehally,
environmental improvement.

Centre for Application of Science and Technology to Rural Areas
Indian Institute of Science,
Bangalore 560012.
Contact K.S. Jagadish

Friends of Mysore Zoo
A 3/2 Ninth Main,
Saraswatipuram,
Mysore 570009
Range of educational activities

Students Movement for Preservation of environment
23, New Bamboo Bazaar,
Bangalore-560051
Contact Chief Co-ordinator.

KERALA

Environmental Centre Kerala Sastra Sahitya Parishad
Parishad Bhavanam,
Trichur 680 002.
Contact Babu Ambat,
eco-develomental, environmental awareness.

One Earth-One Life
PO. Edat,
Cannanore Distt 670 327
Contact John C. Jacob,
nature camps, action, awareness, conservation & promotion of alternate energies.

MADHYA PRADESH

Ekalavya
E 1/20 Arera Colony,
Bhopal 462 016.
Contact Vinod Raina,
Science teaching & environmental awareness in schools.

Paryavaran Parishad
215 Goashala Road,
Ratlam 450001
Contact Secretary,
educational activities

Friends Rural Centre
Rasulia,
Hoshangabad
Contact P.C. Aggarwal
Natural farming.

Bastar Society for Conservation of Nature
Jagdalpur, Bastar Distt, 494005.

MAHARASHTRA

Beauty without Cruelty (India Branch)
4, Prince of Wales Drive,
P B 1518,
Wanowrie, PUNE 411040.
Activities to prevent brutality to animals.

Bombay Natural History Society
Horabill House,
Opposite Lion Gate,
Shahid Bhagat Singh Marg,
Bombay-400 023.
Research & Dissimination of information on the natural history of India, Burma & Sri Lanka.

Centre for Education & Documentation
3, Suleman Chambers,
4, Battery Street (Behind Regal Cinema)
Bombay-400 039.
Collection and dissimination of information.

Indian Association for Water Pollution Control
P.O. NEERI,
Nehru Marg,
Nagpur 440 020.

National Society of the Friends of the Trees
A-2 Anand Nagar,
Forget Street, Bombay-400 036.

RAJASTHAN

Seva Mandir
Old Fatehpura,
Udaipur 313 001
Activities related to rural development.

Social Work & Research Centre
Tilonia, Via Madanganj,
Distt Ajmer
Activities related to rural development.

State Resource Centre for Adult Eductaion
7-A, Institutional area,
Ghalana Doongri Scheme,
Jaipur 302 004.
Contact : Ramesh Thanvir,
Environmental awareness & conservation through adult education.

TAMIL NADU

Centre for Appropriate Technology
5, Jawahar Street,
Ramavarmapuram,
Nagercoil-629 001.

Madras Naturalists Society
36, Fourth Main Road,
Raja Annamalaipillam,
Madras.

Madras Snake Park Trust
Raj Bhavan P.O.
Madras-600 022.

Save Nilgiris Campaign
Wahas Buildings,
Charing Cross, Ootacomund
Nilgiris-643 001.

UTTAR PRADESH

Banwari Sewa Ashram
P.O. Govindpur,
Via Turra,
Mirzapur Distt. 231221.
Social Forestry

Dasholi Gram Sevarajya Mandal
Gopeshwar,
Distt Chamoli
U.P. 246 401.
Activities of the Chipko movement afforestation, social forestry & other development.

The Friends of the Doon
18 Nemi Rd,
Dehradun, 248001.
Contact Mady Martin,
Protection of the Doon Valley.

Kasturba Mahila Uthan Mandal
Lakshmi Ashram,
P.O. Kausauni

Almora Distt. 263 639 **Contact :** Radha Bhatt.

Addresses compiled by Keerti Jayaram

Environmental Laws

Major Central Enactments

Water Pollution

The River Boards Act, 1956.

The Merchant Shipping (Amendment) Act, 1987.

The Water (Prevention and Control of Pollution) Act, 1974, amended in 1988.

The Water (Prevention and Control of Pollution) Cess Act, 1977.

The North India Canal and Drainage Act, 1873.

The Indian Fisheries Act, 1897.

The Damodar Valley-Corporation (Prevention of Pollution of Water) Regulation Act, 1948.

The environment (Protection) Act, 1986.

Air Pollution

The Air (Prevention and Control of Pollution) Act, 1981, amended in 1987.

The Indian Boiler's Act, 1923.

The Factories Act, 1948, amended in 1987.

The Industries (Development and Regulation) Act, 1951.

The Mines and Minerals (Regulation and Development) Act, 1947.

The Oriental Gas Company Act, 1857.

The Indian Explosives Act, 1884.

The Explosives Substances Act, 1908.

The Motor Vehicles Act, 1938, amended in 1988 and Rules, 1989.

The Inflammable Substances Act, 1952.

The Petroleum Act, 1934 and Rules, 1979.

The Environmental (Protection) Act, 1986.

Noise Pollution

The Environmental (Protection) Act, 1986.

Marine Pollution

The Shore Nuisance (Bombay and Colaba) Act, 1953.

The Obstruction in Fairways Act, 1891.

The Indian Fisheries Act, 1897.

The Indian Ports Act, 1908.

The Major Port Trusts Act, 1963.

The Merchant Shipping (Amendment) Act, 1987.

The Territorial Waters, Continental Shelf Exclusive Economic Zone and Other Maritime Zone Act, 1976.

The Coastguards Act, 1978.

Hazardous Wastes

The Poison Act, 1919.

Dangerous Drugs Act, 1930.

The Drugs and Cosmetics Act, 1940.

The Factories Act, 1948, amended in 1987.

The Prevention and Food Adulteration Act, 1954.

The Industries (Development and Regulation) Act, 1951.

The Insecticides Act, 1968.

The Environment (Protection) Act, 1986.

The Consumer (Protection) Act, 1986.

Radiation

The Atomic Energy Act, 1962.

Radiation Protection Rules, 1971.

Pesticides

The Insecticides Act, 1968.

The Factories Act, 1948, amended in 1987.

The Poison Act, 1919.

Forest and Wildlife Conservation

The Indian Arms Act, 1978.

The Wild Life (Protection) Act, 1972.

The Indian Forest Act, 1927.

The Forest (Conservation) Act, 1990, as amended in 1988.

Others

The Urban Land (Ceiling and Regulation) Act, 1976.

The Prevention of Food Adulteration Act, 1954.

The Ancient Monuments and Archaeological Sites and Remains Act, 1958.

The Slum Areas (Improvement and Clearance Act), 1956.

Government Agencies

Central Level

A. Land and Soil

1. Ministry of of Agriculture

National Bureau of Soil Survey and Land Use Planning, Nagpur.

National Land Use and Conservation Board, Delhi.

All India Soil and Land Use Survey Organisation, Delhi.

National Land Use and Wasteland Development Council, Delhi.

Central Soil Salinity Research Institute, Karnal (Haryana).

Central Soil and Water Conservation Research and Training Institute, Dehradun.

Central Arid Zone and Research Institute, Jodhpur.

The Central Research Institute for Dry Land Agriculture, Hyderabad.

Indian Institute of Soil Science, Bhopal.

Indian Grass-land and Fodder Research Institute, Jhansi.

2. Ministry of Environment and Forests Bhopal.
Gobind Ballabh Pant Himalayan Paryavaran Avam Vikas Sansthan, Almora.
Institute of Forest Genetics and Tree Breeding, Coimbatore.
Institute of Wood Science and Technology, Bangalore.
Institute of Arid Zone Forestry Research, Jodhpur.
Institute of Deciduous Forests, Jabalpur.
Institute of Rain and Moist Deciduous Forests, Jorhat.

Others

Ministry of Energy
Department of Non-conventional Energy Sources, New Delhi.
Commission for Additional Sources for Energy, New Delhi.
Indian Renewable Energy Development Agency, Delhi.

State Level

State Land Use Boards.
State Soil Conservation Research Stations.
State Soil Survey Organisations.
State Departments of Environment and Forests.
State Ground Water Boards.

National Mission on Wasteland Development, New Delhi.

B. Water

1. Ministry of Water Resources
Central Water Commission, New Delhi.
Central Ground Water Board, New Delhi.

2. Ministry of Energy
Central Board of Irrigation and Power, New Delhi.

C. Species Conservation (Flora and Fauna)

1. Ministry of Agriculture
National Bureau of Plant Genetic Resources, New Delhi.
National Bureau of Animal Genetic Resources, Karnal (Haryana).
National Bureau of Fish Genetic Resources, Allahabad.

2. Ministry of Environment and Forests
Botanical Survey of India, Calcutta.
Zoological Survey of India, Calcutta.
Salim Ali Centre for Ornithology and Natural History, Bombay.
National Zoological Park, New Delhi.
Wildlife Institute of India, Dehradun.
Padmaja Naidu Himalayan Zoological Park, Darjeeling.
Council of Scientific and Industrial Research
Central Institute of Medicinal and Aromatic Plants, Lucknow.

Forest

Ministry of Environment and Forests
Forest Survey of India, Dehradun.
Forest Research Institute, Dehradun.
Indian Council of Forestry Research and Education, Dehradun.
Indian Institute of Forest Management,

Shikshamitra
EDUCATION RESOURCE CENTRE
62B, Alipore Road, Kolkata -700027
Ph: 2479 9271

RETURN DATE SLIP

DUE DATE	DUE DATE	DUE DATE

Published by the Schools' Environment Network, an informal group of parents, teachers, students, and resource persons committed to furthering environmental awareness in schools.

The pack evolved as a group process. It was written, compiled and produced by Sumi Krishna with Jean Menezes and Keerti Jayaram. It was designed by Pinaki Dasgupta. Special thanks to: Ashish Kothari (Kalpavriksh), Anubha Banerji, Amit Jayaram, K.P.S. Chauhan, Claire Noronha, Gazala Shahabuddin, Jayashree Oza, Latika Nath, Michael Menezes, the artists of Maadhyam Advertising, the children of Mirambika, Pia Sethi, the children of Ramjas School, R.K. Puram, Sandeep Krishna, Saroja Srinivasan, Sui Ming, Suniti Salaam, Suchitra Srinivasan, Suparna, Torit Mitra.

It was supported by grants from

a) Ministry of Environment and Forests through Bharatiya Vidya Bhavan, New Delhi.

b) World Wide Fund for Nature, India (W.W.F., India) through Alarippu.

Infrastructural support: Ramjas Teachers' Centre.

Printed at Deep Printers.

Our address: C 1/4 Safdarjung Development Area, New Delhi-110016

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